Metabolic Syndrome and Women’s (and Men’s) Health-through Menopause and beyond

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Learning Objectives

• Review Age Related Diseases, and how they are inter-related.
• Review Age related changes influenced by Metabolic Syndrome.
• Review Metabolic changes women (and men) go through as they transition through menopause.
• Understand Prevention and Treatment options for metabolic dysfunctions occurring as women (and men) age.

Test Question:
• Which symptom or issue DOES NOT worsen as women go through menopause:
  • 1. Metabolic syndrome
  • 2. Insulin resistance
  • 3. Headaches
  • 4. Obesity
Determinants of Active Aging

Absolute numbers of persons (in millions) above 60 years of age:

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th></th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>134.2</td>
<td>United States of America</td>
<td>287.5</td>
</tr>
<tr>
<td>India</td>
<td>81.0</td>
<td>Japan</td>
<td>168.5</td>
</tr>
<tr>
<td>United States of America</td>
<td>46.9</td>
<td>United States of America</td>
<td>86.1</td>
</tr>
<tr>
<td>Japan</td>
<td>31.0</td>
<td>Russian Federation</td>
<td>43.5</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>26.2</td>
<td>Indonesia</td>
<td>35.0</td>
</tr>
<tr>
<td>Indonesia</td>
<td>17.1</td>
<td>Brazil</td>
<td>33.4</td>
</tr>
<tr>
<td>Brazil</td>
<td>14.1</td>
<td>Russian Federation</td>
<td>32.7</td>
</tr>
<tr>
<td>Pakistan</td>
<td>8.6</td>
<td>Pakistan</td>
<td>18.3</td>
</tr>
<tr>
<td>Mexico</td>
<td>7.3</td>
<td>Bangladesh</td>
<td>17.7</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>7.2</td>
<td>Mexico</td>
<td>17.6</td>
</tr>
<tr>
<td>Nigeria</td>
<td>5.7</td>
<td>Nigeria</td>
<td>11.4</td>
</tr>
</tbody>
</table>

Adults Aged 65+ Years
1900–2010 with Projections to 2050

NOTES: Projections are based on Census 2000. Number of people aged 65 and 85 years and over based on the residential population.

Average annual health care costs for Medicare enrollees age 65 and over, by age group, 1992–2008

NOTE: Data include both out-of-pocket costs and costs covered by insurance. Dollars are inflation-adjusted to 2008 using the Consumer Price Index (Series CP1-U.RS).
Reference population: These data refer to Medicare enrollees.
SOURCE: Centers for Medicare and Medicaid Services, Medicare Current Beneficiary Survey.
Personal and Behavioral

Medicare Beneficiaries Receiving Services or Treatment for Multiple Chronic Conditions, Adults 65+ Years, 2012

Number of Chronic Conditions

<table>
<thead>
<tr>
<th>Number of Chronic Conditions</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1</td>
<td></td>
</tr>
<tr>
<td>2 to 3</td>
<td></td>
</tr>
<tr>
<td>4 to 5</td>
<td></td>
</tr>
<tr>
<td>6+</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: The 17 chronic conditions were identified through Medicare administrative claims. A Medicare beneficiary is considered to have a chronic condition if the CMS administrative claims data indicate that the beneficiary received a service or treatment for the specific condition. Beneficiaries may have more than one of the chronic conditions. To classify multiple chronic conditions for each Medicare beneficiary, these conditions are counted and grouped into four categories (0-1, 2-3, 4-5 and 6 or more). In addition, all values have been rounded to the nearest integer. Therefore percentages may not add to 100%.

Leading Causes of Death, Adults 65+ Years, 2010

<table>
<thead>
<tr>
<th>Rank</th>
<th>Cause of Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Heart disease</td>
</tr>
<tr>
<td>2</td>
<td>Cancer</td>
</tr>
<tr>
<td>3</td>
<td>Chronic lower respiratory diseases</td>
</tr>
<tr>
<td>4</td>
<td>Stroke</td>
</tr>
<tr>
<td>5</td>
<td>Alzheimer’s disease</td>
</tr>
<tr>
<td>6</td>
<td>Diabetes</td>
</tr>
<tr>
<td>7</td>
<td>Influenza and pneumonia</td>
</tr>
<tr>
<td>8</td>
<td>Kidney disease</td>
</tr>
<tr>
<td>9</td>
<td>Accidents (unintentional injuries)</td>
</tr>
<tr>
<td>10</td>
<td>Septicemia</td>
</tr>
</tbody>
</table>


Percent Change in Age-Adjusted Death Rates Between 2000 and 2010

Alzheimer’s disease 38.7%
Diabetes -4.5%
Cancer -31.6%
Heart Disease -30.5%
Stroke -35.8%

NOTES: Data are for all ages and are age-adjusted.
What is Metabolic Syndrome

- Metabolic syndrome is the name for a group of risk factors that raises your risk for heart disease, diabetes, stroke and Alzheimer’s disease.

- Same for Men/Women, but some criteria vary.

Metabolic Syndrome:
Clustering of Interconnected Metabolic Risk Factors: 3 Required

- Insulin Resistance ± Hyperglycemia
- Obesity
- Hypertension

Atherogenic Dyslipidemia

Prevalence of Metabolic Syndrome Components in Younger and Older Men and Women.

Jennifer L. Kuk, and Chris I. Ardern Dia Care 2010;33:2457-2461

©2010 by American Diabetes Association
As We Age: Body Composition and Homeostasis

- Decrease muscle mass
- Increase body fat
- Changes volume of distribution
- Impaired baroreceptor
  - Orthostatic hypotension
- Impaired thermoregulation (temperature control)

Jennifer L. Kuk, and Chris I. Ardern Dia Care 2010;33:2457-2461
As We Age:
Endocrine

- Decreased glucose tolerance
  - Independent of obesity and inactivity
  - FG decreases 1 mg/dL/decade
- Increased insulin resistance

As We Age:
Cardiovascular

- Decrease LV compliance
  - Increased reliance on atria
- More LVH
  - Stiffer arteries
- Decreased beta-adrenergic responsiveness
  - Decreased max. HR with exercise
For Women,

- **Heart Disease**
  - 70% of women >65 years have CV disease
- **Depression**
  - More likely with multiple chronic conditions
- **Menopause**
  - Less active
  - Lower metabolism
  - Decreased muscle mass
  - Bone mass decreases

**Symptoms attributable to menopause**

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vasomotor symptoms</td>
<td>Associated with changing estrogen levels</td>
</tr>
<tr>
<td>Genitourinary syndrome of menopause (GSM)</td>
<td>Onset sometimes delayed until a few years after FMP</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>Associated with aging + menopause; physiology unclear</td>
</tr>
<tr>
<td>Sexual dysfunction</td>
<td>It’s complicated</td>
</tr>
<tr>
<td>Skin, Hair, Special senses</td>
<td>Variable effects documented</td>
</tr>
<tr>
<td>Joint pain</td>
<td>Associated with estrogen ↓</td>
</tr>
<tr>
<td>Mood/depression</td>
<td>Many estrogen receptors in brain; perimenopause associated mood issues</td>
</tr>
<tr>
<td>Cognition</td>
<td>Data mixed; possibly related to sleep</td>
</tr>
</tbody>
</table>

Let's Focus on Two Risk Factors

Hyperglycemia/Diabetes

Hyperlipidemia

Diabetes: A Growing Challenge
Prevalence in the United States

Centers for Disease Control and Prevention, Division of Diabetes Translation.
### Age-Adjusted Prevalence of Type 2 DM: California Adults Aged \( \geq 18 \) Including Hispanic and Asian Subgroups 2009

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Prevalence of DM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodian/Other Asian</td>
<td>2.85</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>8.74</td>
</tr>
<tr>
<td>Korean</td>
<td>6.10</td>
</tr>
<tr>
<td>Japanese</td>
<td>8.76</td>
</tr>
<tr>
<td>South Asian</td>
<td>12.17</td>
</tr>
<tr>
<td>Filipino</td>
<td>4.34</td>
</tr>
<tr>
<td>Chinese</td>
<td>10.61</td>
</tr>
<tr>
<td>African American</td>
<td>10.83</td>
</tr>
<tr>
<td>Other Hispanic</td>
<td>12.58</td>
</tr>
<tr>
<td>Mexican</td>
<td>4.41</td>
</tr>
</tbody>
</table>

Data from N.D. Wong, California Health Interview Survey (unpublished).

### Diabetes Mellitus: Lifetime Risk

#### A. Males

- Hispanic
- Non-Hispanic Black
- Other
- Non-Hispanic White

#### B. Females

- Hispanic
- Non-Hispanic Black
- Other
- Non-Hispanic White

Data from Narayan et al. *JAMA* 2003;290:1884-1890.
Diabetes and CVD

- Atherosclerotic complications responsible for
  - 80% of mortality among patients with diabetes
  - 75% of cases due to coronary artery disease (CAD)
  - Results in >75% of all hospitalizations for diabetic complications

- 50% of patients with type 2 diabetes have preexisting CAD. (This number may be less now that more younger people are diagnosed with diabetes.)

- 1/3 of patients presenting with myocardial infarction have undiagnosed diabetes mellitus
Diabetes (DM) and Cardiovascular Disease (CVD)

- Atherosclerosis is responsible for:
  - 80% of mortality for diabetes patients
  - Results in 75% of hospitalizations for diabetic complications

- 50% of patients with type 2 DM have preexisting CVD

- 1/3 of patients presenting with myocardial infarction have undiagnosed DM

Northammar A, et.al. Lancet 2002;359;2140-2144

Mechanisms by which Diabetes Mellitus Leads to Coronary Heart Disease

- Hyperglycemia
- Insulin Resistance
- Inflammation
- Dyslipidemia
- Thrombosis
- Subclinical Atherosclerosis
- Atherosclerotic Clinical Events

AGE=Advanced glycation end products, CRP=C-reactive protein, CHD=Coronary heart disease, HDL=High-density lipoprotein, HTN=Hypertension, IL-6=Interleukin-6, LDL=Low-density lipoprotein, PAI-1=Plasminogen activator inhibitor-1, SAA=Serum amyloid A protein, TF=Tissue factor, TG=Triglycerides, tPA=Tissue plasminogen activator

Biondi-Zoccai GGL et al. JACC 2003;41:1071-1077.
What Can You Do?

**Prevention**
- Eat Healthy
- Don’t Smoke
- Control Blood Pressure
  - Low Salt (for many people)
  - Stress reduction
  - Exercise
- Physical Activity
  - Endurance
  - Strength
  - Balance
  - Flexibility
- Mental Activity

**Treatment**
- Eat Healthy
- Don’t Smoke
- Control Blood Pressure
  - Low Salt (for many people)
  - Stress reduction
  - Exercise
- Physical Activity
- Mental Activity
- **Take Medications if needed**

Eat Healthy

**Do**
- Consult Guidelines
- Talk to health professionals/specialists
- Use Moderation
- Get Variety
- Make it a part of a full preventative outlook:
  - Exercise
  - Stress reduction
  - Mental activities

**Don’t**
- Follow Fad Diets
- Buy something expensive over the internet without researching
- Remove one whole food group (is NO Carb possible or desirable?)
- Give UP!
Diabetes Prevention Program:
Reduction in Diabetes Incidence

N=3,234
39% lower incidence of diabetes in the lifestyle vs. metformin group

PREDIMED STUDY: Primary Prevention of High Risk Patients Randomized to Mediterranean Diet vs Control

Don’t Smoke

• **Tips From Former Smokers®**
  This CDC campaign Web site lets you view the ads, learn more about the people featured and their health conditions, and access quit-smoking resources.

• 1-800-QUIT-NOWexternal icon
  A free, phone-based service with educational materials, coaches, a quit plan, and referrals to local resources to help you quit tobacco use.

• 1-855-DEJELO-YA (1-855-335-3569)external icon
  A free, phone-based service to help Spanish speaking persons quit tobacco use.

• BetobaccoFree.govexternal icon
  This HHS Web site provides one-stop access to tobacco-related information, including information on quitting tobacco use, from its various agencies.

• smokefree.govexternal icon
  A Web site that provides free, accurate information and assistance to help you quit smoking and stay tobacco-free.

• smokefree.gov (en Español)external icon
  A Spanish-language Web site that provides free, accurate information and assistance to help you quit smoking and stay tobacco-free.

• SmokefreeWomenexternal icon
  A Web site that provides free, accurate information and assistance to help women quit smoking and stay tobacco-free.
Control Blood Pressure

**Lifestyle**
- Exercise
- Stress Reduction
  - Breathing Exercises
  - Meditation
  - Tai Chi/Yoga
  - Acupuncture, etc
- Diet
  - DASH

**Medications**
- Effective
- With Potential Side Effects

Physical Activity

- Physical Activity
  - Endurance
  - Strength
  - Balance
  - Flexibility
LIFE Study

- The ability to walk without assistance is critical for older people to live in a community and function well.
- The study showed that a regular, balanced and moderate exercise program followed for an average of 2.6 years reduced the risk of major mobility disability by 18 percent in an elderly, vulnerable population.
- Exercises included walking, and strength, flexibility, and balance training activities.

Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE)

- The study looked at the effects of cognitive training on cognitive abilities and everyday function.
- Benefits at ten years were seen in reasoning and speed, but not memory.
- ~60% of participants maintained or improved Instrumental Activities of Daily Living (IADLs).
Go4Life

- Go4Life is an exercise and physical activity campaign from the NIA, designed to encourage older adults to become more active.

http://www.nia.nih.gov/Go4Life

... is research-based and aims to encourage older adults to make exercise and physical activity a regular part of everyday life.
Go4Life is for **YOU** if you …

- are 50+
- are interested in knowing how to get started with regular physical activity and exercise
- are interested in re-starting a lapsed exercise program
- just want to know how to use regular exercise to improve their health as you age

What does the 4 stand for in Go4Life?
The 4 Types of Exercises Recommended for Adults 50+ are

1. Endurance
2. Strength
3. Balance
   • Especially important for Older Women
4. Flexibility

Endurance Exercises...
✓ Increase your breathing and heart rate and improve the health of your lungs, heart and circulatory system.
✓ Examples: Swimming, running, brisk walking, biking, dancing, basketball.
✓ Endurance activities make it easier to
  = walk uphill and not get short of breath
  = push your grandchild on a swing
Strength Exercises...

✓ Use weight or resistance to increase muscle strength.

✓ Examples: lifting weights, using resistance bands, leg lifts, squats, arm curls.

✓ Increased muscle strength can help you
  • Climb stairs
  • Carry groceries
  • Open jars

Balance Exercises...

✓ Improve your ability to control your body’s position, whether moving or still.

✓ Examples: stand-on-one-foot, heel-to-toe walk, tai chi. Tai Chi, Yoga

✓ Good balance can help
  • Prevent falls
  • Stand on tiptoe without teetering
  • Walk on uneven sidewalks without falling
Flexibility Exercises...
- Use stretching to help you stay flexible and limber.
- Examples: shoulder stretch, back of leg stretch, calf stretch, ankle stretch, yoga.
- Being more flexible can help you
  - Feel less stiff when getting out of bed
  - Bend over to tie your shoe or put on socks
  - Button a shirt or blouse

Health Benefits of Regular Exercise (1)
- Helps maintain and improve your physical strength and fitness.
Health Benefits of Regular Exercise (2)

- Helps improve your ability to do the things you enjoy.

Health Benefits of Regular Exercise (3)

- Helps improve your balance, which can prevent falls.
Health Benefits of **Regular** Exercise (4)

- Helps manage and prevent diseases like diabetes, heart disease, breast and colon cancer, and osteoporosis.

Health Benefits of **Regular** Exercise (5)

- Helps reduce feelings of depression.
Health Benefits of Regular Exercise (6)

- May improve mood and overall well-being.

Health Benefits of Regular Exercise (7)

- May improve or maintain some thinking skills, such as your ability to shift quickly between tasks, plan an activity, and ignore irrelevant information.
For substantial health benefits, adults should do at least:

- 150 minutes (2 hours and 30 minutes) a week of moderate-intensity physical activity

  **OR**

- 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity

  **OR**

- an equivalent combination of moderate- and vigorous-intensity aerobic activity.

Aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week.

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Get Ready!

- Browse the free Go4Life materials on the website and choose ones to order.

- Order the materials from the website or call 1-800-222-2225.
Free Go4Life materials include...

- Exercise & Physical Activity Guide
- Workout to Go
- “Call to Action” Postcard
- Wall Posters
- Bookmarks
- An exercise Age Page
- Tracking Tools
- Spanish Resources

For Women- Menopause

- Take Prescription Medications
  - Pro’s and Con’s are complicated
Non-hormonal Prescription Treatments for Symptoms

- SSRIs paroxetine, citalopram, escitalopram
- SNRIs venlafaxine, desvenlafaxine
- Gabapentin
- Only Paroxetine 7.5 mg is FDA approved
- Most trials agent vs placebo and not Hormones
- Venlafaxine XR 75 mg vs estradiol 0.5 both effective with slight advantage to estradiol

Other Treatments

- Cognitive behavioral therapy
  - Decreased severity (not frequency) in RCTs
- Clinical hypnosis
  - Decreased severity and frequency in 2 RCTs
- Soy
  - No benefit in most RCTs
- Black Cohosh (Remifemin) 20 mg bid
  - Trials mixed
- Stress Reduction and…. EXERCISE!
Key Takeaways—Older Adults

- Both the number and proportion of the population age 65 and over are increasing.
- Average annual health care costs are increasing.
- Medicare spending is highest for those with 4 or more chronic conditions.
- 37.6% of adults have 4 or more chronic conditions (2012).
- Metabolic Syndrome is a Key Factor

Key Takeaways.. Continued

- Metabolic Syndrome includes 3: Obesity, hypertriglyceridemia, hyperglycemia/insulin resistance, Low HDL, hypertension
- Men and Women go through similar changes as they age, but women have Menopause in addition
- There are lifestyle changes that are very effective, and reduce morbidity and mortality
Questions and Comments